

CenSeam Project: Assessing Biodiversity Patterns on Seamounts to Identify Knowledge Gaps

Project dates: To begin in 2008

Funded by: International Seabed Authority

CenSeam is a programme within the Census of Marine Life which aims to determine the role of seamounts in the biogeography, biodiversity, productivity and evolution of marine organisms, and to evaluate the effects of human exploitation on seamounts. The International Seabed Authority is partnering with CenSeam to assess the patterns of biodiversity on seamounts and the factors that determine these patterns in order to identify the gaps in current knowledge, and encourage collaborative research initiatives that will address them. The results of this project will also be used by the Authority to minimize the risks of mining activities on deep-sea seamounts.



photo from CenSeam - www.censeam.niwa.co.nz

Seamounts are undersea mountains, often of volcanic origin, that feature prominently in the world's underwater topography. Seamounts may be hotspots of biodiversity and play an important role in patterns of marine biogeography. Often highly productive ecosystems for fish, marine mammals, and seabirds, seamounts are also of potential interest for deep-seabed

mining. The long-term effects of prospecting and potential impacts of mining, however, are vastly understudied.

The lack of marine scientific research in seamount areas can be blamed in part on the sheer enormity of the task. The number of seamounts over 1 km high has been estimated at more than 100,000 and there are many more with smaller elevation. Relatively few seamounts have been studied; about 350 have been sampled, and less than 200 in any detail. As a result, the biodiversity of most seamounts on a global scale is poorly known.

In March 2006 the International Seabed Authority held a workshop to determine how exploration and mining activities on cobalt-rich crusts may impact seamount biodiversity and the biogeography of seamount species.

This knowledge, combined with the results of other workshops, is being used by the Authority to develop environmental baselines for exploration and future mining of cobalt-rich crusts.

Through presentations and discussions over the three-day workshop, participants examined gaps in the current knowledge of seamount fauna patterns of diversity and the degree to which species are restricted or isolated to the seamount or the immediate seamount area. Workshop participants also discussed opportunities for future collaboration through marine scientific research to close the knowledge gaps.

CenSeam was one participant in this workshop. CenSeam aims to strategically guide future sampling in seamount areas to fill critical knowledge gaps and target understudied regions and types of seamounts. CenSeam is undertaking these tasks to make progress towards achieving global understanding of how seamount ecosystems are structured and function to form a global census of marine life on seamounts.

As a result of their participation in the workshop, CenSeam and the International Seabed Authority began to outline a collaborative research initiative that has three main activities:

- 1) assessing patterns of community composition and diversity of fauna on seamounts (with and without cobalt-rich crusts) and the factors that determine these patterns;
- 2) examining gaps in current knowledge of these patterns to support future collaborative research to address them; and
- 3) providing the Authority with recommendations to input into the development of environmental guidelines for future mining contractors.

Participants in this collaboration include scientists who have contributed to the Authority's workshops, as well as their colleagues in the wider international scientific community. Data collected from this research will be extremely valuable for both seamount science and the future management of seamount resources.